

CLAIMS

What is claimed is:

1. A cyclone separating apparatus for use in a vacuum cleaner, comprising:
 - 5 a first cyclone for separating dust from dust-laden air;
 - a plurality of second cyclones for separating minute particles of dust from dust-laden air by a second separation of dust from dust-laden air with a centrifugal force; and
 - an inlet-outlet cover disposed on an upper part of the first cyclone and the second cyclones, for a fluid-communication between the first cyclone and the second cyclones, the inlet-
 - 10 outlet cover through which purified air cleaned by the second cyclone, is discharged.
2. The apparatus according to claim 1, wherein the inlet-outlet cover comprises:
 - an air channel connected so air discharged from the first cyclone flows into the second cyclone; and
 - 15 a plurality of outlet channels penetrating into the inlet-outlet cover so air can be discharged therethrough from the second cyclone.
3. The apparatus according to claim 2, wherein a predetermined portion of the outlet

channel is inserted into the second outlet when the inlet-outlet cover is joined to the second cyclone allowing air to be discharged through the outlet channel.

4. The apparatus according to claim 3, wherein one end of the outlet channel is connected
5 to the second outlet formed on one side of the second cyclone, and the other end is open in an upward direction of the inlet-outlet cover.

5. The apparatus according to claim 4, wherein the other end of the outlet channel is cut into a slope inclining toward a central direction of the inlet-outlet cover.

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6. The apparatus according to claim 5, wherein the first cyclone comprises:
a first chamber in which dust-laden air is separated by a centrifugal force;
a first inlet formed in the first chamber, through which dust-laden air flows, and
a first outlet formed in the first chamber from which air is discharged.

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7. The apparatus according to claim 6, wherein each of the second cyclones comprises:
a second chamber for separating dust a second time using a centrifugal force from air
which was previously separated at the first cyclone;

a second inlet formed in the second chamber, through which air, discharged from the first cyclone flows; and

a second outlet formed in the second chamber, through which dust-separated air is discharged.

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8. The apparatus according to claim 7, wherein the first chamber is formed substantially in a cylindrical shape and the second chamber is formed with a part of one end substantially in a frustum-conical shape.

10 9. The apparatus according to claim 4, wherein the cyclone separating apparatus further comprises a cyclone cover installed on an upper part of the inlet-outlet cover.

10. The apparatus according to claim 9, wherein the cyclone cover is substantially in a conical shape with open upper and lower spaces.

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11. The apparatus according to claim 4, wherein the second cyclones are installed on an outer periphery of the first cyclone to enclose the first cyclone, and, the first cyclone and the second cyclones are integrally formed.

12. The apparatus according to claim 11, wherein a separating partition is installed between the second cyclones.

5 13. A vacuum cleaner comprising:

a vacuum cleaner main body for generating a suction force to draw-in dust-ladened air;

a bottom brush for drawing-in dust from a bottom, which is a surface to be cleaned, using the suction force. Wherein the bottom brush is in fluid-communication with the vacuum cleaner main body; and

10 a cyclone separating apparatus installed in the vacuum cleaner main body,

wherein the cyclone separating apparatus comprises,

a first cyclone for separating dust-ladened air;

a plurality of second cyclones for separating fine dust particles by a second separation of air which was previously separated at the first cyclone using centrifugal

15 force; and

an inlet-outlet cover installed on an upper part of the first cyclone and the second cyclones, for fluid-communication between the first cyclone and the second cyclones through which dust-removed air from the second cyclone is discharged.

14. The cleaner according to claim 13, wherein the inlet-outlet cover comprises:

an air-channel connected to allow air discharged from the first cyclone flows into the second cyclone; and

5 a plurality of outlet channels penetrating through the inlet-outlet cover allowing air to discharge from the second cyclone.